

REMARKS

Applicants have amended claims 18, 20, and 23-30. New claims 32-42 have been added. Support for the amendments and newly added claims may be found, for example, in the specification at paragraphs [0015], [0016], [0019], [0020], [0023], and [0024], as well as elsewhere in the specification and original claims.¹ As a result, claims 17-18 and 20-42 are pending in the application.

Claims 17, 18, 20-22, 24-26, and 28-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over “Voltage Changes Along Geranium Petioles after Leaf Blade Excision” by Mulhern, Jr. et al. (“Mulhern”) in view of “Introductory Circuit Analysis” by Boylestad (“Boylestad”). Claims 23, 27, and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mulhern in view of Boylestad and further in view of U.S. Patent No. 6,393,317 to Fukuda et al. (“Fukuda”).

Applicants respectfully request reconsideration of the present application in view of the above amendments and the following remarks.

Claims 17, 18, 20-22, 24-26, and 28-30 and 35 U.S.C. §103(a)

The rejection of claims 17, 18, 20-22, 24-26, and 28-30 under 35 U.S.C. § 103(a) as being unpatentable over Mulhern in view of Boylestad is respectfully traversed.

Applicants respectfully assert that *prima facie* obviousness has not been established. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Applicants respectfully submit that Mulhern in view of Boylestad does not describe, teach, or suggest all of the limitations of independent claims 17, 18, 20, 24, and 28. Mulhern describes measuring voltage changes in a plant after sustaining an excision, while making no mention of calculating currents. The Office Action provides that Mulhern fails to disclose calculating a current.² Applicants respectfully submit that it would not be obvious to a person having ordinary skill in the art to combine the method for measuring voltage changes

¹ All specification paragraph references are made to U.S. Patent Publication No. US 2004/0005024.

² See Office Action, at page 2, section 2.

in a plant, described in Mulhern, with Boylestad's disclosure of Ohm's Law to arrive at a method for measuring current flow through a living body, as recited in the present listing of claims.

For example, claim 17 provides a method for measuring current flow through a living body comprising providing a known impedance. Ohm's Law provides that current flowing across a fixed impedance is equal to the voltage difference across the fixed impedance divided by the fixed impedance.³ While Mulhern describes measuring the voltage difference between two points on a plant, Mulhern makes no mention of providing a known impedance such that the current flowing through the plant could be calculated using Ohm's Law. Therefore, one of ordinary skill in the art would not utilize the method for measuring voltage changes in a plant, taught by Mulhern, in combination with Ohm's Law to arrive at the presently claimed invention of measuring current flow in a living body. Similar analysis applies to claims 18, 20, 24, and 28. For at least these reasons, Applicants respectfully submit that claims 17, 18, 20, 24, and 28 are patentable over Mulhern in view of Boylestad, and respectfully request their allowance.

Furthermore, Mulhern fails to describe, teach, or suggest conditioning the voltage measured between a first position and a second position on a living body with data conditioning circuitry comprising an electronic filter, and using the conditioned voltage to calculate the current flow in a living body. Rather, Mulhern teaches routing the voltage signal received by an electrode through an amplifier and fails to make any mention of an electronic filter.⁴ Moreover, since it merely discloses Ohm's Law, Boylestad fails to cure the deficiencies of Mulhern. For at least these reasons, claims 20 and 24 are patentable over Mulhern in view of Boylestad.

Similarly, Mulhern fails to describe, teach, or suggest storing a known impedance or body impedance data in a computer readable memory and calculating a current flow using the stored known impedance or body impedance data. As discussed above, the Office Action provides that Mulhern does not disclose calculating a current. Further, Mulhern fails to describe calculating a current using a known impedance or body impedance data stored in a

³ See Boylestad, at page 85.

⁴ See Mulhern, at page 2.

computer readable memory. Mulhern does not describe storing a known impedance or body impedance data in a computer readable memory such that it could be retrieved for a current calculation. Boylestad's disclosure of Ohm's Law fails to cure the deficiencies of Mulhern. For at least these reasons, claims 18, 20, and 24 are patentable over Mulhern in view of Boylestad.

In addition to reasons discussed above, Applicants respectfully submit that claim 28, as amended, is patentable over Mulhern in view of Boylestad at least for the reasons described below. The method for measuring contact current in a living body of claim 28 comprises measuring a voltage between a first position and a second position on a living body without separately applying a current; providing body impedance data; and calculating the contact current flow based upon the measured voltage and the provided body impedance data. As discussed above, Ohm's Law provides that current flowing across a fixed impedance is equal to the voltage difference across the fixed impedance divided by the fixed impedance. To accurately calculate the contact current in a living body using a measured voltage and Ohm's Law, body impedance data for the impedance between the two measurement points on the body is required. Different sets of measurement points on a living body can have varying impedance values. Mulhern does not describe, teach, or suggest providing body impedance data such that the contact current flowing through the plant could be accurately calculated using Ohm's Law. For at least these reasons, claim 28 is patentable over Mulhern in view of Boylestad.

In view of the foregoing, Applicants respectfully submit that the teachings of Mulhern in view of Boylestad are insufficient to render claims 17, 18, 20, 24, and 28 *prima facie* obvious under 35 U.S.C. § 103(a). Therefore, Applicants respectfully request the allowance of claims 17, 18, 20, 24, and 28. As claims 21-22, 25-26, and 29-30 depend from and further limit claims 20, 24, and 28, Applicants respectfully assert that claims 21-22, 25-26, and 29-30 are patentable over Mulhern in view of Boylestad and respectfully request their allowance.

Claims 23, 27, and 31 and 35 U.S.C. §103(a)

The rejection of claims 23, 27, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Mulhern in view of Boylestad and further in view of Fukuda is respectfully traversed. For reasons similar to those described above, Mulhern in view of Boylestad and in further view of Fukuda fails to describe, teach, or suggest all of the limitations of claims 23, 27, and 31. As claims 23, 27, and 31 depend from and further limit claims 20, 24, and 28, Fukuda fails to cure the deficiencies of Mulhern and Boylestad with respect to independent claims 20, 24, and 28. Fukuda describes an instrument for measuring impedance in a living body that comprises a high frequency current generation source used to generate a high frequency current that is applied to the living body. Fukuda makes no mention of the methods for calculating a current as recited in the present listing of claims. Therefore, Applicants respectfully request the allowance of claims 23, 27, and 31.

New Claims 32-42

New claims 32-42 have been entered into the present application. Applicants respectfully assert that the cited prior art does not render new claims 32-42 anticipated or obvious. Mulhern, Boylestad, or Fukuda, alone or in combination, fail to describe, teach, or suggest all of the claims limitations of claims 32-42. In addition to reasons similar to those described above, Mulhern, Boylestad, or Fukuda, alone or in combination, fail to describe a method for measuring the current flow in a living body that comprises conditioning a measured voltage with data conditioning circuitry comprising an adjustable threshold detector. Further Mulhern, Boylestad, or Fukuda, alone or in combination, fail to describe a method for measuring the current flow in a living body that comprises executing an executable program stored in a computer readable memory. For at least these reasons, Applicants respectfully request that claims 32-42 also be allowed.

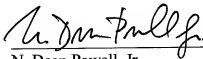
CONCLUSION

With the above amendments and remarks, Applicants believe that all rejections have been obviated. Thus, each of the claims remaining in the application is in condition for immediate allowance. A passage of the instant invention to allowance is earnestly solicited.

Applicants believe that no additional fee is necessary, other than those associated with additional claims; however, should a fee be deemed to be necessary, the Commissioner is hereby authorized to charge any fees required by this action or any future action to Deposit Account No. 16-1435.

Should the Examiner have any questions relating to the instant application, the Examiner is invited to telephone N. Dean Powell, Jr. at 336-607-7347 to discuss any issues with the present application.

Respectfully submitted,



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